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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,144	07/20/2004	Hendrik Dijkstra	NL020049	3436

24737 7590 08/06/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

ARCOS, CAROLINE H

ART UNIT

PAPER NUMBER

2195

MAIL DATE

DELIVERY MODE

08/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/502,144

Applicant(s)

DIJKSTRA ET AL.

Examiner

CAROLINE ARCOS

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/05/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2004 and 05 May 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-15 are pending for examination.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter “computer readable medium” in claim 13. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required

Claim Objections

3. Claims 1-15 are objected to because of the following informalities:
 - a. As per claim 1, line 7, it is not clearly understood where does “the low priority process” reside? (i.e. in the real time operating system or the non real time operating system?) Line 9, it is not clearly understood where does “another process” reside? And is it the high priority process? This could be a 112 2nd issue.
 - b. As per claim 10, it has same deficiency as claim 1.
 - c. As per claim 3, line 4-6, “said high priority thread” and “said low priority thread” lacks of antecedent basis. This could be a 112 2nd issue. Applicant is advised to keep a consistent way of naming throughout the claims language to avoid confusion.
 - d. As per claim 12, it has the same deficiency as claim 3.
 - e. As per claim 9, line 1 “characterized” is vague and fails to point out distinctly the applicant invention. This could be a 112 2nd issue.

f. As per claim 13, it is not clearly understood whether the claim is a "computer readable" claim or "a method" claim. This could be a 101 issue, since the claim falls in two statutory classes. (If the applicant intended a "computer readable" claim, the applicant is advised to put claim 13 in an independent form by copying the limitation to claim 1 to claim 13.

g. As per claim 14, it is not clearly understood whether the claim is a "set top box" claim or "a system" claim. This could be a 101 issue, since the claim falls in two statutory classes. (If the applicant intended a "set top box" claim, the applicant is advised to put claim 14 in an independent form by copying the limitation to claim 10 to claim 14.

h. As per claim 15, it is not clearly understood whether the claim is a "television set" claim or "a system" claim. This could be a 101 issue, since the claim falls in two statutory classes. (If the applicant intended a "television set" claim, the applicant is advised to put claim 15 in an independent form by copying the limitation to claim 10 to claim 15.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 4-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kush (US 6874, 144), in view of Jones et al. ("Hard Real time with RTX on windows NT",

USENIX, 1999, Pages 1-10)

6. As per claim 1, Kush teaches the invention substantially as claimed including a method of executing processes with different priorities in a multiprocessing environment comprising execution of a low priority process and a high priority process (col. 5, lines 60-66) where the high priority process and the low priority process share a given resource (col. 3, lines 64-67; col. 4, lines 1-2), and wherein the multiprocessing environment (col. 1, lines 26-30) includes non-real time operating system (Unix), the method comprising the step of:

temporarily raising an effective priority of the low priority process when the low priority process is going to use the shared resource (col. 5, lines 57-61), where the effective priority is raised to be above a priority of an other process in the multiprocessing environment (col. 3, lines 55-60; col. 4, lines 2-10).

7. Kush doesn't teach that the environment includes real-time and non-real-time operating systems. However, Jones teaches that the environment includes real-time and non-real-time operating systems (abstract, lines 1-16; pg.3, left col., lines 13-32; pg.6, right col., lines 9-49; pg. 7, left col., lines 20-26).

8. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Kush and Jones teaching because Jones teaching of introducing real time operating system in a non real time operating system would improve system performance and scheduling techniques and allows the implementation of the complex functionality that a real

time operating system provides.

9. As per claim 2, Kush teaches that the step of raising the effective priority comprises the steps of: executing/assigning an additional process accessing the shared resource on behalf of the low priority process where the additional process has a priority equal to the effective priority, and (col. 7, lines 21-33; col. 6, lines 10-20).

10. Kush doesn't explicitly teach that the additional process is synchronized with the low priority process. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to conclude from Kush teaching that the additional process would have to be synchronized with a thread within itself because a process would not function properly otherwise.

11. As per claim 4, the combined teaching doesn't explicitly teach that the additional process and the low priority process are synchronized using a first semaphore and a second semaphore.

12. However, mutex are also referred to as binary semaphore and a process of the thread holding a semaphore could as well be accessing other shared resources with semaphores in order to make se of the combined shared resources together for a particular job. It would have been obvious to one of ordinary skill in the art that the time the invention was made to have used semaphore to access shared resources for a process and one for a thread within a process to make use of the combined resource held by the process as a whole such as simultaneous disk or printer

access.

13. As per claim 5, Kush teaches the effective priority is raised at least until the low priority process has accessed or used the shared resource or the high priority process has accessed or used the shared resource if the high priority process attempts to access or use the shared resource while the low priority process has access or uses the shared resource (col. 7, lines 51-58, wherein the high priority process is the calling thread and the low priority process is holding the mutex or lock)

14. As per claim 6, Kush teaches the effective priority of the low priority process is raised to be slightly below that of the high priority process (col. 10, lines 37-48).

15. As per claim 7, Kush teaches that access to the shared resource is controlled by a mutex (col. 7, lines 20-33).

16. The combine teaching doesn't explicitly teach that said additional process will not wait for the low priority process as long as it owns the mutex. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to conclude that a calling thread not to wait for the whole process in order to carry out its tasks).

17. As per claim 8, wherein shared resource is selected from the group of:
a shared memory,
a shared file and

a shared input/output (I/O) device (col. 1, lines 32-36).

18. As per claim 9, Jones teaches that the high priority process executes time-critical tasks (pg. 2, right col. Lines 18-21).

19. As per claim 10, it is the system claim of the method claim 1. Therefore, it is rejected under the same rational.

20. As per claim 11, it is the system claim of the method claim 2, therefore, it is rejected under the same rational.

21. As per claim 13, it is the computer readable medium claim of the method claim 1. Therefore, it is rejected under the same rational.

22. As per claim 14, the combined teaching doesn't teach that Set-top box comprising the system according to claim 10. However, it would have been obvious to one of ordinary skill in the art to take advantage of the use of real time and non real time system by installing the system on a set top box that improve performance of executing real time tasks such as video/audio.

23. As per claim 15, the combined teaching doesn't teach that television set comprising the system according to claim 10. However, it would have been obvious to one of ordinary skill in

the art to take advantage of the use of real time and non real time system by installing the system on a television set that improve performance of executing real time tasks such as video.

24. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kush (US 6874, 144), in view of Jones et al. ("Hard Real time with RTX on windows NT", USENIX, 1999, Pages 1-10) and further in view of Werres et al. (US 5,295,264).

25. As per claim 3, Jones teaches that the real-time operating system comprises said high priority thread and said additional process and where the non-real time operating system comprises said low priority thread (pg. 6, lines 12-42).

26. The combined teaching doesn't explicitly teach that the multiprocessor environment comprises a real-time operating system and a non-real time operating system running on a single processor at least at a given time. However, Werres teaches that the multiprocessor environment comprises a real-time operating system and a non-real time operating system running on a single processor at least at a given time (col. 2, lines 39-64).

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Kush, Jones and Werres because Werres teaching of he multiprocessor environment comprises a real-time operating system and a non-real time operating system running on a single processor at least at a given time which would improve

system performance and throughput by saving on resources and having a compact system.

28. As per claim 12, it is the system claim of the method claim 3. Therefore it is rejected under the same rational.

Response to Arguments

29. Applicant's arguments with respect to claim1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sha et al., "Priority inheritance protocols: an approach to Real-time synchronization", IEEE, 1990, pages 1175-1185

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

32. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit: 2195

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROLINE ARCOS whose telephone number is (571)270-3151. The examiner can normally be reached on Monday-Thursday 7:00 AM to 5:30 PM.

34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

35. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

/Caroline Arcos/
Examiner, Art Unit 2195